

[Third Edition.]

PATENT SPECIFICATION.



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PROVISIONAL SPECIFICATION.

Improvements in Porous Rubberised Fabrics and Methods of Producing same.

I, PERCY HERBERT HEAD, of The Orchards, Station Road, Attenborough, Nottinghamshire, a British Subject, do hereby declare the nature of this invention to be as follows:—

This invention comprises improvements in porous rubberised fabrics and methods of producing same. It is well known to coat fabrics with rubber latex, and a rubber coating so applied has a certain inherent degree of elasticity. It has been found, however, that when the fabric is itself of a stretchy nature, as is knitted fabric, the elasticity or stretch of the rubber coating is less than that of the fabric with the consequent result that the elasticity of the composite fabric is reduced below that of the uncoated fabric or the rubber coating is fractured when the composite fabric is stretched. This invention has for an object to provide a rubber-coated fabric in which the natural elasticity of a comparatively stretchy fabric is not impaired by the addition of the rubber coating, and the invention is particularly, but not exclusively, applicable to knitted fabrics.

Broadly speaking, the invention resides in a method of producing a rubber-coated fabric or other flexible base (e.g. leather), which includes the step of coating the base with rubber latex containing sulphur and an accelerator. An advantage of this process is that it is possible to vulcanise the rubber without subjecting it to prolonged heating at temperatures that may be destructive of or injurious to the base. Moreover it is possible to carry out the vulcanisation in the cold without subjecting the materials to the fumes of sulphur chloride or similar objectionable substances used in cold vulcanising processes.

The accelerator should be water-soluble, and a convenient one is Diethylamine

Diethyldithiocarbamate or Diethylammoniumdiethyldithiocarbamate. Preferably the various proportions, by weight, are as follows. To rubber latex is added approximately 2% (of the dry rubber contents) of sulphur in a suitable form, (preferably colloidal) and also 0.25 to 0.5% of the accelerator.

The mixture is sprayed upon the surface of the base, the distance from which it is sprayed and the fineness to which it is atomised being suited to the particular base under treatment because it is preferred that the latex shall not penetrate through it (when a fabric is used). Subsequently, the mixture is dried and the coated base submitted to heat, from 65° F. to 212° F., the time varying in accordance with the temperature. At the lower limit the time is in the order of seven days, and at the upper limit thirty minutes.

The invention is applicable to numerous articles, such as surgical bandages, belts, corset materials, nets, hosiery and footwear. By coating the base upon one face only and then folding it, or by bringing the coated surfaces of two layers of base face to face, a rubberised material is provided in which the rubber layer is invisible. Thus fabrics of different compositions may be united, as for example silk and cotton fabrics for ladies' evening dress shoes. Art silk coated with rubber according to this invention becomes non-frayable, ladder-proof and easier to stitch.

The surface provided by the rubber coating is non-slipping, and is therefore useful for the backs of carpets, rugs and the like.

Dated this 14th day of May, 1932.

ERIC POTTER,
Chartered Patent Agent,
London and Nottingham.

COMPLETE SPECIFICATION.

Improvements in Porous Rubberised Fabrics and Methods of Producing same.

I, PERCY HERBERT HEAD, of The Orchards, Station Road, Attenborough, Nottinghamshire, a British Subject, hereby declare the nature of this invention
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and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention comprises improvements in porous rubberised fabrics and in methods of producing same and has for its principal object the production of fabrics of this kind which are particularly applicable for use for articles of clothing such as corsets, brassieres and the like.

Heretofore it has been proposed to produce a two-sheet water-proofed material by calendering a "heat-sensitive" emulsion or dispersion of rubber to the required gauge between the two sheets, but such treatment obviously produces a solid or non-porous material which is useless for articles of clothing such as those mentioned heretofore.

It has also been proposed to make neckties from thin rubber backed facing material vulcanised to a backing of similar or different material; the object being to render very thin materials, which in themselves are unsuitable for neckties, sufficiently firm for tying into knots and to minimise distortion or creasing. Here again a non-porous material is produced, while it will be appreciated that elasticity, which is a characteristic of the present invention, is definitely undesirable in a necktie.

Also a process for making imitation leather has been proposed wherein knitted or woven fabrics are cemented together by gutta percha. Gutta percha cement is, however, non-elastic and non-porous, and consequently is unsuitable for use in the present invention.

I am also aware that hair cloths and interlinings have been proposed composed of a plurality of layers of hair cloth united by a rubber solution which maintains the fabrics porous and non-water-proof; but it may here be stated that the present invention does not include the use of hair cloths as same are comparatively hard and stiff and, although suitable for padding, upholstery and similar purposes, are useless for articles of clothing such as corsets, brassieres and the like.

Accordingly the present invention provides a method of producing a composite elastic and porous rubberised fabric which consists in spraying the surface of at least two pieces of fabric with a coating of vulcanising rubber latex, placing the fabric pieces face to face with the rubber coated surfaces in contact and uniting the fabric pieces by the application of pressure thereto.

It will thus be seen that when the completed fabric is used for articles of cloth-

ing the rubber cannot come into contact with the flesh of the wearer and furthermore the various laminations may be of different materials and/or of varying colours.

In carrying the present invention into effect two pieces of fabric, and more particularly but not necessarily knitted fabric, are sprayed with rubber latex of any known vulcanising type but preferably of 50% to 60% concentration.

By the expression "vulcanising rubber latex" is meant either a latex of a pre-vulcanised or self-curing type capable of being vulcanised at normal temperature and atmospheric pressure, or a latex which is vulcanised by subjecting same to suitable heat.

A suitable mix for the treatment is as follows:—

To a 60% solution of stabilised rubber latex add approximately 5% (of the dry rubber contents of the latex) of zinc oxide, 2.5% of colloidal sulphur and 1% of zinc diethyldithiocarbamate.

This mix is, however, only given as an example and it is to be understood that any suitable ultra accelerator may be employed, while it is also possible to add other ingredients such as dyes or fillers to the above or similar mixture and still retain the desired elasticity of the coating. Moreover the mixture may be diluted with water which for particular purposes may be made slightly alkaline with liquid ammonia preferably .880 specific gravity and preferably not exceeding 8%.

Immediately after the pieces of fabric have been sprayed they are placed face to face with the two faces on which the latex has been deposited in contact with one another and whilst the latex is still tacky a light pressure of say 5 to 10 lb. per square inch is applied to the composite fabric. This light pressure is sufficient to unite the two pieces of treated fabric, and it may here be stated that when too great a pressure is employed globules of latex are forced through the fabric which destroy or tend to destroy the porosity and appearance of the completed fabric.

Subsequent to the foregoing treatment the laminated fabric thus formed is passed over heated rollers or into a heated atmosphere for vulcanising the latex. Vulcanisation of the latex is obtained by submitting the laminated fabric to a temperature of 100° C. for half an hour or a temperature of 90° C. for one hour, 80° C. for two hours etc.

If desired however this heat treatment may be obviated by employing a pre-vulcanised or self curing latex for uniting the pieces of fabric.

After the latex has been vulcanised the laminated fabric may be subjected to any temperature and/or pressure without in any way deleteriously affecting the porosity of the composite fabric, providing always that the temperature and/or pressure to which the laminated fabric is subjected is not sufficient to affect the base fabric itself.

It will of course be appreciated that if desired three pieces of fabric may be united by means of two intermediate layers of rubber latex or that the number of layers of fabric may be increased as required.

Turning now to the question of porosity this is maintained firstly because the base fabric is tensioned or stretched during the application of the latex to one of the faces thereof and secondly because the latex is applied in the form of a more or less fine mist and does not penetrate the fabric.

Preferably the latex is applied to the base fabric through the medium of pressure guns which are positioned at a distance of from three to four feet away from the fabric. The cross sectional diameter of the nozzles of the gun is as small as conveniently possible for example 1—16 inch and the pressure is preferably in the neighbourhood of 35 lbs. per square inch.

If conditions permit the latexing process may be continuous the base fabrics being traversed in front of the latex guns and being thereafter united by the application of light pressure as previously described.

It will of course be apparent that the time during which the latex is sprayed on the base fabric will affect the porosity of the final product and that same will vary in accordance with the size of the pressure guns and the particular fabric under treatment. In any case however the exposure before the latex guns will be sufficiently long for the base fabric to

receive sufficient coating for adhering the fabrics but insufficient to close up all the pores or interstices of the fabric.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A method of producing a composite elastic and porous rubberised fabric which consists in spraying the surface of at least two pieces of fabric with a coating of vulcanising rubber latex, placing the fabric pieces face to face with the rubber coated surfaces in contact and uniting the fabric pieces by the application of pressure thereto.

2. A method of producing porous rubberised fabrics according to Claim 1 wherein the fabric to be treated is tensioned or stretched and the latex is applied thereto under pressure such as by one or more pressure guns.

3. A composite elastic and porous rubberised fabric produced by the method claimed in either of claims 1 or 2 comprising a plurality of layers of fabric and in which each layer is united to the next adjacent layer by means of a compounded rubber latex.

4. A fabric according to claim 3 wherein the layers of base fabric are of varying colours and/or texture.

5. A laminated knitted fabric comprising two base layers of fabric united by an intermediate layer of rubber latex in accordance with claim 1.

6. A method of treating fabrics substantially as hereinbefore described.

7. Laminated rubberised fabrics substantially as hereinbefore described.

Dated this 13th day of June, 1933.

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